# Hungry Canyons Alliance

## Stream Stabilization in Western Iowa


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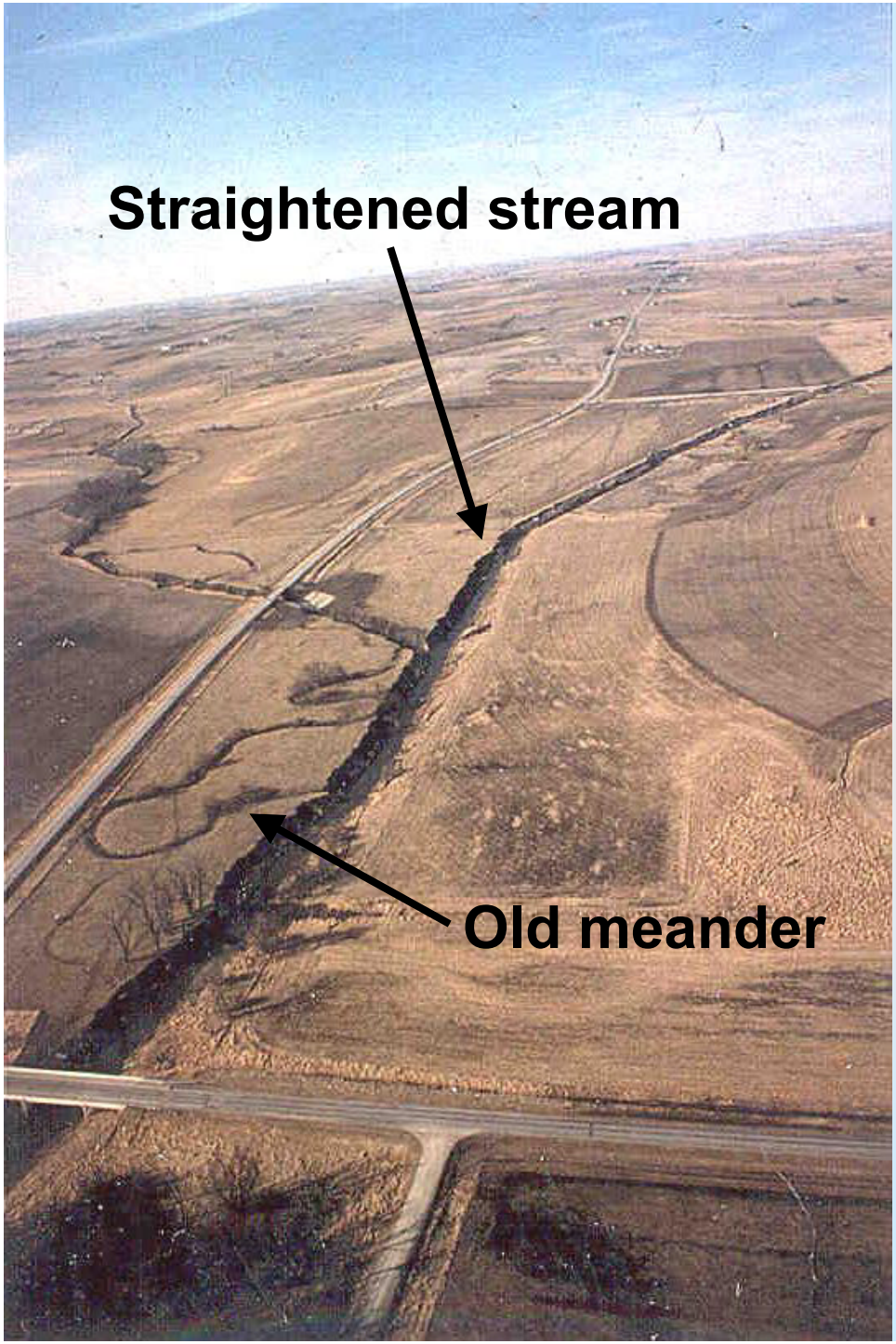


# Causes of Streambed Degradation

Highly erodible loess soils

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Stream straightening and land use changes

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Higher water velocities

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Channel downcutting

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Accelerated soil erosion

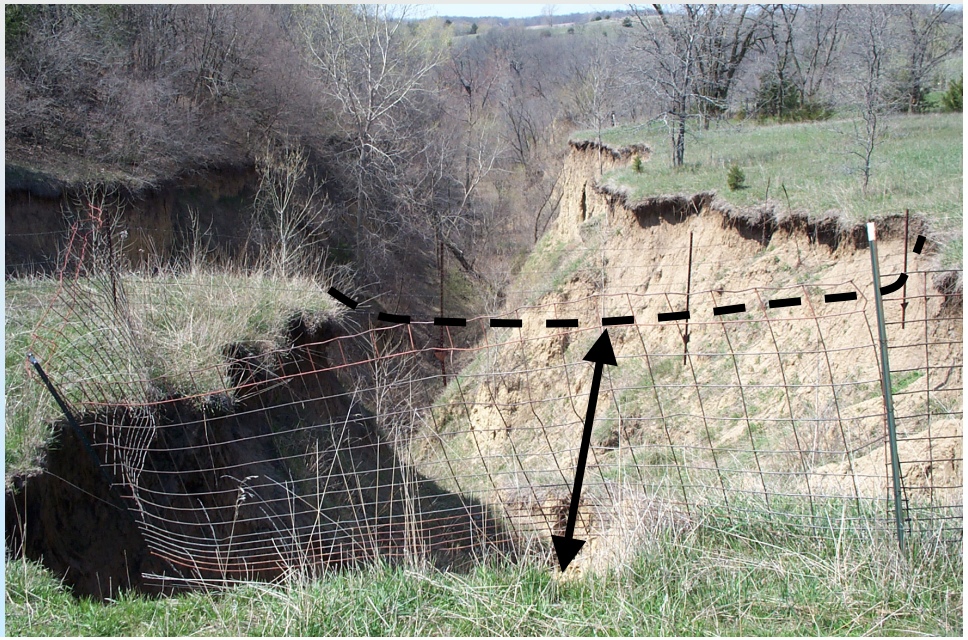
## Streambed Degradation - Knickpoints

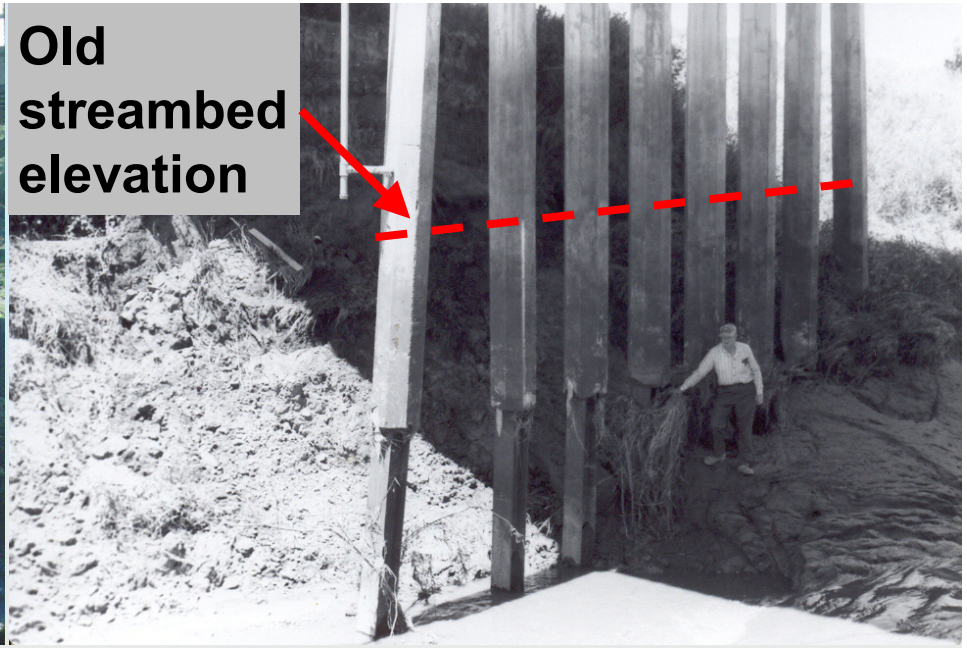
## Streambed Degradation – Headcuts, Bank Failure, and Stream Widening

**Page County knickpoint: Formed during May 2007 floods; Migrated 314 feet upstream by December 2007; ~5,000 tons of sediment eroded**



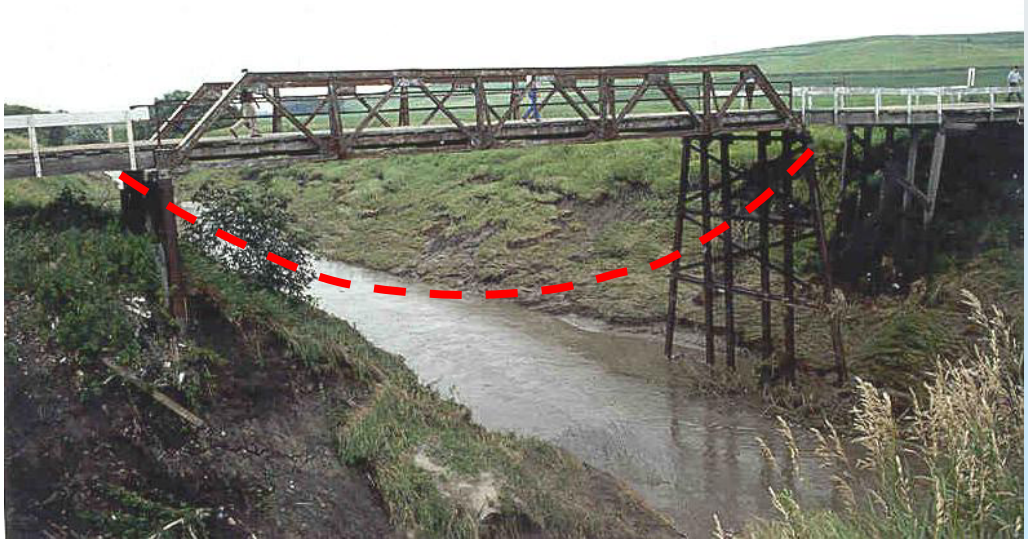

## Gully Growth Rates: 1 Year - Cass County; 5 Years – Fremont County

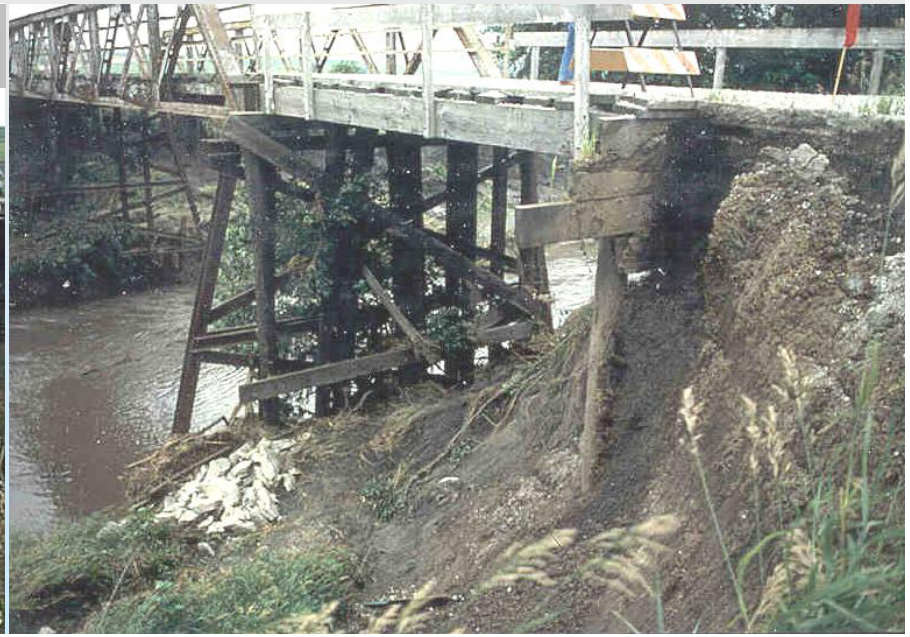




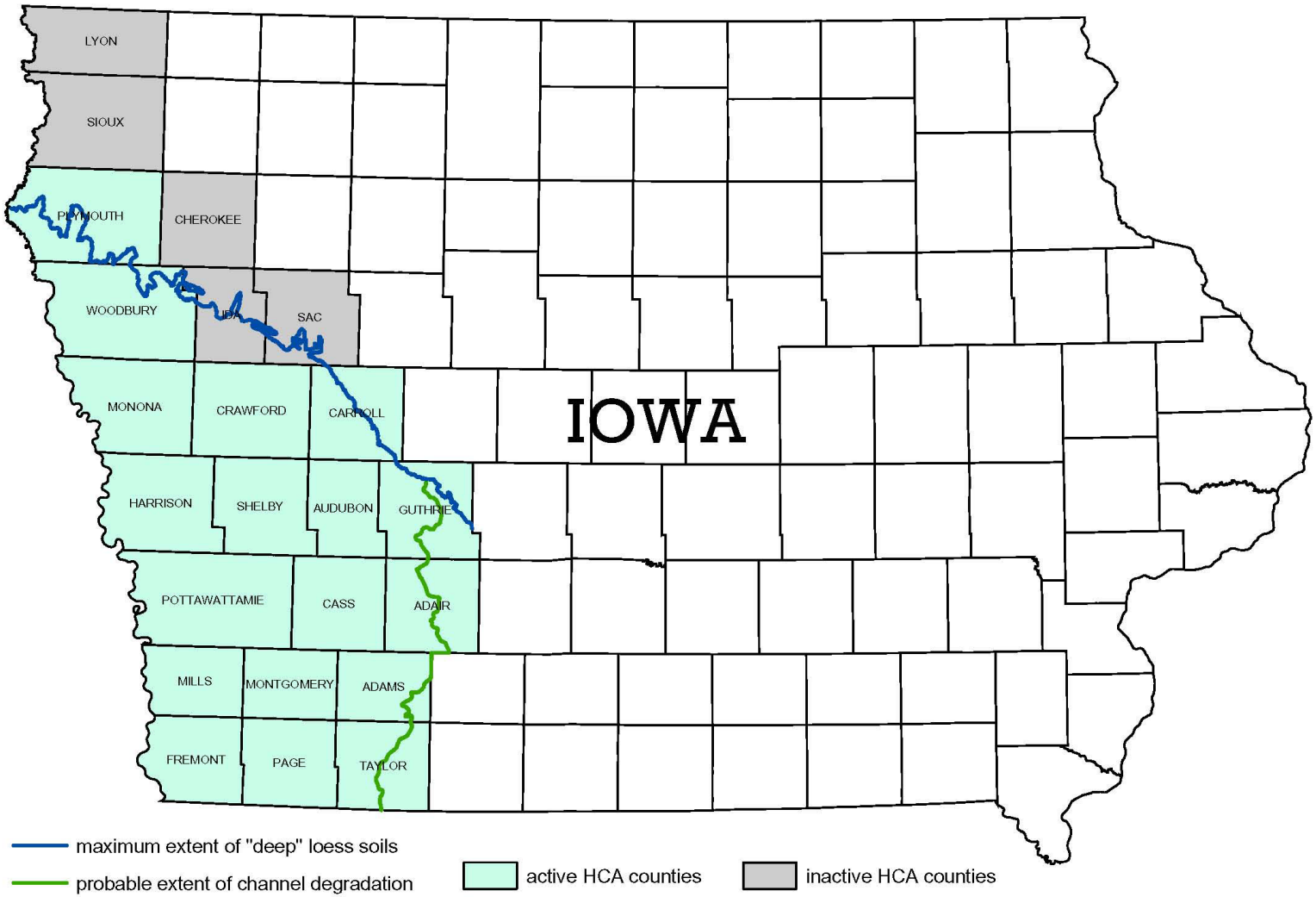

**Bridge damage due to streambed degradation**

**Approximate old channel cross section**





## Counties in the Hungry Canyons Alliance



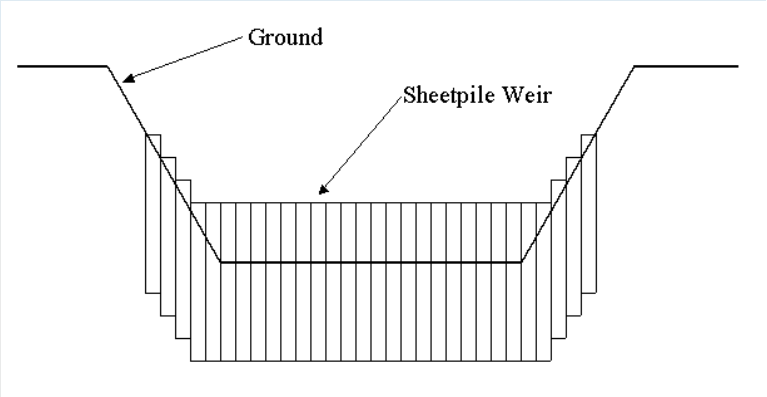

The HCA's purpose is to focus attention on the problems of, and develop solutions related to, stream channel degradation in 23 counties of western Iowa with deep loess soils

# HCA Streambed Stabilization and Watershed Approach

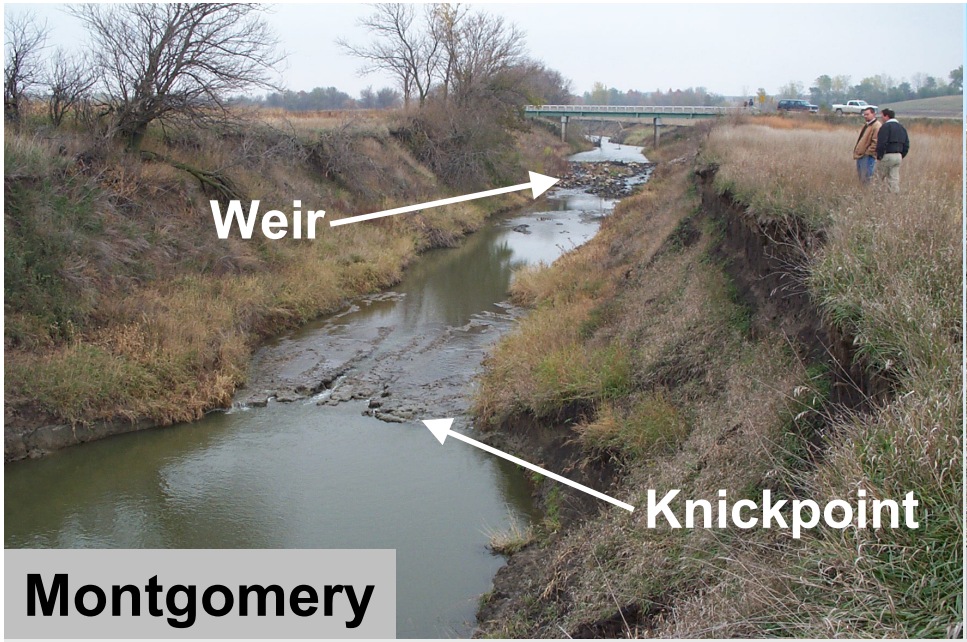
- Streambed stabilization key to preventing erosion & protecting infrastructure
- Knickpoints affect entire watershed as erode upstream
- Structures planned on watershed scale
- Stream videos locate erosion
- Structures at regular intervals change  stream profile from erosive steep incline to stable stair-step pattern
- Site locations planned across political boundaries

# Grade Control Structures

- Raised steel sheet pile weir
- Rip-rap, concrete grout slopes
- Decreases slope of streambed
- Prevents further downcutting




- Creates an upstream backwater condition
  - Sediment settles out upstream
  - Reduces sediment loads
  - Protects bridge pilings





## HCA Grade Control Structures - 319 Total

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# Fish passage weirs

Montgomery

Audubon

Fremont

Crawford

## Other Types of Grade Control Structures

Plymouth

Pottawattamie

# Northern Natural Gas Pipeline & Structure Protection Project

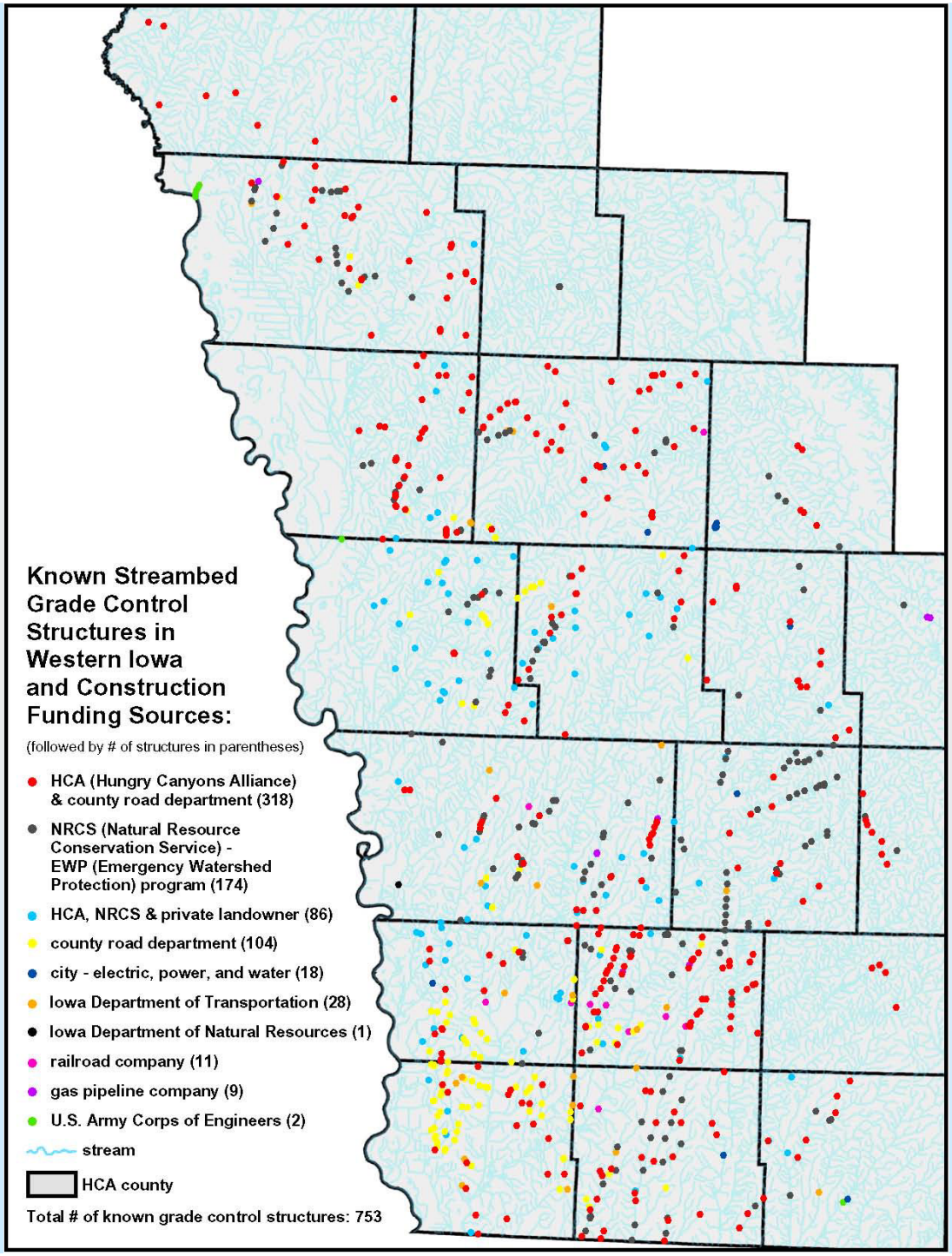
## - Before HCA Involvement



# Northern Natural Gas Pipeline & Structure Protection Project

## -After HCA Involvement




Known Streambed Grade Control Structures in Western Iowa and Construction Funding Sources:
(followed by # of structures in parentheses)
HCA (Hungry Canyons Alliance) & county road department (318)
NRCS (Natural Resource Conservation Service) - EWP (Emergency Watershed Protection) program (174)
HCA, NRCS & private landowner (86)
county road department (104)
city - electric, power, and water (18)
Iowa Department of Transportation (28)
Iowa Department of Natural Resources (1)
railroad company (11)
gas pipeline company (9)
U.S. Army Corps of Engineers (2)
stream
HCA county
Total # of known grade control structures: 753

# Floods of 2007-2008 and EWP Repairs

# Hungry Canyons Alliance and NRCS Emergency Watershed Protection (EWP) Program

- 155 western Iowa flood repair projects
- $13 million in federal NRCS-EWP program available to western Iowa
- 25% local match requirement for EWP projects
- Local county governments have budget shortfalls
- HCA state cost share (at 10%) and county funds (at 15%) to **match millions of dollars of federal EWP funding** (at 75%)

# Hungry Canyons Alliance, Emergency Watershed Protection Program, & Economic Stimulus

- Leverage of $13 million federal funds
- Match needed:
  - HCA = $1.3 million; counties = $2 million
- Construction over next two years
- Job creation for extra construction projects, materials, & heavy equipment

# Benefits of Hungry Canyons Alliance Grade Control Structures

- Since 1992, 330 bridges/culverts protected
- Protection of numerous utility lines (electric, phone, gas, sewer, water)
- Protection of farmland (570 acres)

# Benefits of Hungry Canyons Alliance Grade Control Structures

- Reduced sediment loads and improved water quality (20.1 million tons of sediment protected)
- Prevention of soil movement into the Missouri River
- Reduction of the “dead zone” in the Gulf of Mexico
- **For every $1 invested in Hungry Canyons Alliance structures, more than $4.24 in property value and 0.98 tons of soil is protected.**

**Costly Problem**

# Affordable Solution

# Thank You

# Any Questions?